PACKAGING TRAY FORMED FROM ABSORBANT MATERIAL

DESCRIPTION

This invention relates to a container for use in the storage and/or display of products, such as fresh meat and other types of fresh food product, and is related especially, but not exclusively, to a container which is tray-shaped or dish-shaped and which may be made of a plastics material.

There is a wide range of existing tray-shaped containers for the storage and display at point-of-sale for, say, fresh meat. In the simplest form, these are made of a single layer of a solid or cellular plastics material

During storage of fresh meat and other food products, fluids may exude from the foodstuff and seep in to the internal wall of the container causing undesirable discoloration thereof. In these circumstances, some form of absorbent material may be located upon the inner surface of the base of the container to absorb such fluid and to prevent the seepage of the exuded fluid on to the remainder of the container wall structure.

There have been a number of developments and improvements to separate the absorbent material from the food product being packaged. The absorbent material may be sandwiched between a perforated film or sheet and the base of the container or, in another example, the tray is made of a cellular structure which is capable of absorbing fluid if the surface is perforated. The disadvantages of these developments is that the fluid may seep through the absorbent material or through the cellular foam structure and exude from the open rim or flange of the container.

Also, some fresh food products, particularly fresh meat products, are stored and displayed at point-of-sale in containers of the type in question with

a prescribed atmosphere of gas, such as oxygen and carbon dioxide, depending on established practice in modified atmosphere packaging of fresh food products, in which case, the container has to have its normally open top closed and sealed to the rim of the container by means of, for example, a transparent barrier film.

Containers for this use are made from plastics materials which have at least one layer which is an impermeable fluid barrier. This is normally on the inner surface of the container. It is obvious that if this surface is perforated in order to allow juices or liquids, which exude from the packaged foodstuff, to be absorbed on an absorbent material or cellular structure within the base or wall of the container, then the modified gas atmosphere can escape from the container by the same route.

It is an object of the present invention to provide a container which overcomes, or at least substantially reduces, the disadvantages associated with the known types of container, particularly those used for the storage of fresh meat and other food products, as discussed above.

Accordingly, the invention resides in a container, preferably of tray or dish-like shape, comprising a porous wall structure defined by a base-wall and a continuous side-wall upstanding therefrom, wherein at least a portion of the wall structure defines a space which is sealed in a fluid-tight manner and which is at least partially filled by a material from which the wall structure is made, said at least partially filled space being arranged to retain liquid therein.

By "porous wall structure" is meant, throughout this specification, a wall structure through whose thickness a fluid, namely a gas or liquid, is capable of migrating or otherwise flowing; for example, a wall structure of cellular material of open cell structure.

The outer surface of the wall structure is preferably provided with an impermeable fluid barrier film layer.

Preferably, the defined space is sealed from the remainder of the container wall structure by conventional techniques or, for example, by ultrasonic welding, to provide, for example, a continuous space-defining seal between the inner and outer surfaces of the wall structure across the thickness thereof. Also, the space is preferably provided in a base wall of the container wall structure.

The space may be completely filled by the material from which the container wall structure is made by, say thermoforming; for example, a cellular material, such as expanded polystyrene, of open cell structure which can preferably absorb a fluid. If, say, the inner surface of the wall structure is provided with an impermeable, fluid barrier film layer, then that layer, in the region of the space, may be perforated to permit fluid in the container to seep or otherwise pass into the space where it can be absorbed by the material of the wall structure or other absorbant material located in the space.

In this manner, any fluid such as blood or other fluid exuding from, say, a fresh meat product which is stored and displayed within the container and which migrates into the space defined within the wall structure, is prevented from migrating or otherwise passing further into the thickness of the remainder of the container wall structure.

Similarly, any gas(es), provided as prescribed atmosphere within the container and retained therein by an impervious, gas barrier film as a closure for the container, which migrates into the space defined within the container wall structure, usually via perforations in an impermeable, gas barrier sheet layer on the inner surface of the wall structure, is prevented from migrating further through and along the thickness of the wall structure and escaping from

the container via the exposed open edge of the wall structure at the rim or peripheral flange of the container.

Additionally, the container may be provided with a peripheral rim or flange attached to the upper edge of the side wall, said space-defining seal may be provided in or across the thickness of the flange or may alternatively be provided along the distal edge thereof.

The gas barrier film seal may be effected along the peripheral rim or flange of the container, and in an embodiment the gas barrier film seal and said space-defining seal are conterminous.

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Embodiments of container in accordance with the invention will now be described by way of example and with reference to the accompanying drawings in which:

Figure 1 is a bottom plan view of a first embodiment of container;

Figure 2 is a section along the line II-II in Figure 1;

Figure 3 is a sectional end view of a second embodiment of container;

Figure 4 is a sectional end view of a third embodiment of container; and

Figure 5 is a sectional end view of a fourth embodiment of container.

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Referring firstly to Figures 1 and 2 of the drawings, a rectangular, tray-shaped container thermoformed from open cell expanded polystyrene sheet, as indicated generally at 1, has a porous wall structure comprising a base wall 12,

a continuous, tapered side wall 13 upstanding therefrom and an outwardly extending peripheral rim 14. The inner and outer surfaces of the wall structure have thereon respective impermeable, fluid barrier film layers 15 and 18.

The inner layer 15 on the base wall 12 of the container 1 is perforated, in a regular array of perforations, as shown at 16, to allow any excess blood and/or other fluids exuding from a fresh meat product placed on the base wall 12 of the container 1, to pass into the thickness of the base wall 12 for absorption therein.

At least the major portion of the base wall 12 of the container 1 is sealed, in a fluid type manner at 17, from the remainder of the wall structure of the container 1 to define a space 100 sealed from the remainder of the wall structure. In this manner, any liquid such as blood and/or any other exuded fluids, absorbed in that sealed space 100 of the base wall 12, is unable to migrate into the thickness of the remainder of the wall structure of the container 1, thereby preventing, or at least substantially reducing, any undesirable discoloration of the remainder of the wall structure and eliminating any seepage of the liquid from the open flange or rim 14 of the container 1.

As seen in Figure 1, the seal 17 is continuous and generally rectangular in plan, following the profile of the rectangular base wall 12, of the container 1. That seal 17, which is effectively represented by the bringing together, in a fluid-type manner, of the outer surface and inner surface of the base wall 12, such being formed by conventional thermoforming techniques.

If needs be, the container 1 may be closed, with the associated fresh meat product (not shown) contained therein, by means of a transparent, impervious, fluid barrier film 19 sealed to the rim or peripheral flange 14 of the container 1.

Thus, any modified atmosphere of, say, oxygen and carbon dioxide gases, within the sealed container 1, is retained therein, as any of the gas(es) is prevented from migrating into and through the thickness of the remainder of the wall structure and escaping from the exposed free edge of the peripheral flange or rim 14.

In use of the container 1, any blood or other fluids exuding from a fresh meat product placed upon the inner surface layer 15 of the base wall 12 of the container 1 will be absorbed into the space 100 defined within the thickness of the base wall 12 but filled with absorbent material from which the container has been thermoformed, is unable to seep into the remainder of the wall structure, due to the continuous seal 17, as discussed above. Thus, undesirable discoloration of the remainder of the wall structure and loss of any modifying gas(es) are eliminated or substantially reduced.

Turning now to Figure 3, a container 30 of similar rectangular form to that described in connection with Figures 1 and 2 is shown. The container 30, which is thermoformed from open cell expanded polystyrene, comprises a base wall 32, a continuous, tapered side-wall 33 upstanding therefrom and an outwardly extending peripheral rim 34. The inner and outer surfaces of the wall structure have thereon respective impermeable, fluid barrier film layers 35 and 38.

The inner layer 35 on the base wall 32 of container 30 is perforated, in a regular array of perforations, as shown at 36, to allow any excess blood and/or other fluids exuding from a product, such as a fresh meat product, placed on the base wall 32 of the container 30, to pass into the thickness of the base wall 32 for absorption therein.

The wall structure is sealed, at 37, in a fluid type manner to define a space 100' sealed from the peripheral or distal edge of the rim 34. In this manner, any liquid such as blood and/or any other exuded fluids, absorbed in that sealed space 100' of the base and side wall 32 and 33 respectively is unable to migrate to the distal edge of the rim 34 and seep or flow out of the container 30.

The seal 37 is continuous and generally rectangular in plan, following the profile of the peripheral rim 34 of the container 30. The seal 37, which is effectively represented by the bringing together, in a fluid type manner, of the outer and inner surfaces 38, 35, is effected by an ultrasonic weld. Such welds fuse two layers together to provide a fluid tight seal 37 such that liquids and gases cannot migrate across it. In Figure 3, a double ultrasonic weld is used to provide the seal 37. The seal 37 could also be effected by the application of heat and pressure as is conventional in the art, for example during thermoforming of the container 30.

As with the first embodiment, the container 30 may be provided with a transparent impervious, fluid barrier film 39 sealed to the rim or peripheral flange 34 of the container 30. Such a film 39 effectively closes the container 30 and provides a sealed container 30 from which gases and fluids cannot escape, the seal 37 preventing migration from the rim 34 and the barrier film 39 sealing the container 30 from the atmosphere.

Figure 4 shows a similar container 40 to that of Figure 3, comprising a base wall 42, a continuous, tapered side-wall 43 upstanding therefrom and an outwardly extending peripheral rim 44. The outer surface of the wall structure has thereon an impermeable, fluid barrier film layer 48, the inner surface being a finishing layer 45 provided on the open cell expanded polystyrene.

The container 40 is provided with an array of perforations, as shown at 46, to allow any liquids seeping or exuding from a product placed on the base wall 42 to flow or migrate into the base wall 42 of the container 40. The container 40 is sealed at 47 by an ultrasonic weld between the peripheral rim 44 and a transparent impervious, fluid barrier film 49.

Thus, any fluid exuding from a product is retained in a space 100'' defined by the thickness of the wall structure 42, 43 and by the barrier film 49. The seal 47 prevents migration of fluids from the distal edge of the rim 44 and the provision of a barrier film 49 seals the container 40 from the atmosphere.

Referring now to Figure 5, there is shown a further embodiment of container 50 comprising a base wall 52, a continuous, tapered side-wall 53 upstanding therefrom and an outwardly extending peripheral rim 54. The inner and outer surfaces of the wall structure have, thereon, respective impermeable, fluid barrier film layers 55 and 58.

The inner barrier film layer 55 is, in the region of the base wall 52 provided with an array of perforations, as shown at 56, to allow any liquids seeping or exuding from a product placed on the base wall 52 to flow or migrate into the base wall 52 of the container 50. The distal edge of the rim 54 is provided with a fluid-tight seal 57 which may be effected by a solvent or a paint applied to that edge. The seal 57 effectively bridges the gap between the inner and outer layers 55, 58 across the thickness of the wall structure at the peripheral edge. Thus a space 100''' is provided, from which liquids contained or retained therein cannot escape. The wall structure is provided by open-cell expanded polystyrene which absorbs liquids which flow into the space 100''' from a product placed on the base 52 of the container 50.

The container 50 may be provided with an impervious, fluid barrier film 59 which is sealed to the rim 54 of the container 50 and thereby closes the container 50, sealing any product contained therein from the atmosphere.

In a further embodiment the fluid barrier inner layer 55 of the container 50 may be replaced with a simple finishing layer, the seal 57 being effected between the impervious barrier layer 59 and the outer barrier layer 58, similar to that described with reference to Figure 4, except at the periphery of the rim 54.

It is noted that each of the barrier films discussed above comprises a laminate of, for example, five layers of which preferably one constitutes a gas barrier layer, comprising, for example, copolymers of ethylene and vinyl alcohol (EVOH), the other layers being adhesives or stabilising layers. The barrier film layers are applied to the body of open-cell expanded polystyrene in a manner well established in the art.

Thus, it can be seen that all embodiments of the invention provide containers which include spaces which are at least partially defined by their respective wall structures and which are sealed, in a fluid-tight manner, from the remainder of their wall structures, to prevent any fluid from spreading therein to or into the remainder of the container or, from or out of the container, as the case may be. Further, any gas migration along the thickness of the wall structure, or from the container, is at least partially reduced and, in certain circumstances, eliminated.

It is to be appreciated that, although the embodiments of container described above are generally tray-shaped the invention can embody any other shape of container having a porous wall structure.